

ABSTRACT

AN OPTICAL WAVEGUIDE STRUCTURE

5 A waveguide structure according to the invention comprises a core layer (10),
having a refractive index n_{core} , and an array of rods (11) in the core layer having a
refractive index n_{rods} . The refractive indices satisfy the inequality:

$$n_{\text{rods}} > n_{\text{core}}$$

10 In a planar waveguide structure buffer (12) and cladding (13) layers are
included, having a refractive index n_{buffer} and n_{cladding} respectively. The refractive
indices then satisfy the inequality:

$$n_{\text{rods}} > n_{\text{core}} > n_{\text{cladding}} \text{ and } n_{\text{buffer}}$$

15 This condition provides greater vertical confinement of the E-field of an optical
signal passing through the waveguide. Furthermore, it allows waveguides to be
formed of a glassy material having a similar refractive index and core dimensions to
that of a fibre. A high refractive index contrast within the photonic crystal region is
used while totally eliminating the need for mode conversion to launch light in and out
of the waveguide.

(Figure 2)